

CLAIMS

I 1. A device for separating cells using an antibody selected from a chimera antibody, a single chain antibody or combinations thereof.

2. A device for separating CD4-positive cells using an antibody selected from a chimera antibody, a single chain antibody which binds to CD4 molecules or combinations thereof.

3. A device for separating CD4-positive cells using a chimera antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 1 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 2 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 3 in the Sequence Listing, an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 4 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 5 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 6 in the Sequence Listing, and an Fc region of a human type.

4. A device for separating CD4-positive cells using a single chain antibody, wherein the antibody comprises an H chain variable region

of which CDR-1 is an amino acid sequence represented by Sequence ID No. 1 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 2 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 3 in the Sequence Listing, and an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 4 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 5 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 6 in the Sequence Listing.

5. A device for separating CD34-positive cells using an antibody selected from a chimera antibody, a single chain antibody which binds to CD34 molecules or combinations thereof.

6. A device for separating human CD34-positive cells using ^{a chimera} antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 43 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 44 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 45 in the Sequence Listing, an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 46 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 47 in the Sequence Listing, and CDR-3 is an amino acid sequence

represented by Sequence ID No. 48 in the Sequence Listing, and an Fc region of a human type.

7. A device for separating human CD34-positive cells using a single chain antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 43 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 44 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 45 in the Sequence Listing, and an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 46 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 47 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 48 in the Sequence Listing.

a 1/ 8. The device for separating cells according to ^{claim 1} ~~any one of claims 1 to 7~~, wherein the antibody comprises an amino acid sequence containing a basic amino acid or acidic amino acid added to the C-terminal or N-terminal or both of the amino acid sequence of the antibody.

a 1/ 9. The device for separating cells according to ^{claim 1} ~~any one of claims 1 to 8~~, wherein the antibody selected from a chimera antibody, a

single chain antibody or combinations thereof is bound to an active group of a polypropylene nonwoven fabric reacted with a haloacetaminomethylating agent.

IV
10. A method for separating or detecting cells, comprising using an antibody selected from a chimera antibody, a single chain antibody or combinations thereof. *does not require deriv*

11. A method for separating or detecting human CD4-positive cells, comprising using an antibody selected from a chimera antibody, a single chain antibody which bind to CD4 molecules or combinations thereof.

12. A method for separating or detecting human CD4-positive cells, comprising using a chimera antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 1 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 2 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 3 in the Sequence Listing, an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 4 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 5 in the Sequence Listing,

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and CDR-3 is an amino acid sequence represented by Sequence ID No. 6 in the Sequence Listing, and an Fc region of a human type.

Abstract

13. ~~A method for separating or detecting human CD4-positive cells, comprising using a single chain antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 1 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 2 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 3 in the Sequence Listing, and an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 4 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 5 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 6 in the Sequence Listing.~~

VI

14. A method for separating or detecting human CD34-positive cells, comprising using an antibody selected from a chimera antibody, a single chain antibody which bind to CD34 molecules or combinations thereof.

15. A method for separating or detecting human CD34-positive cells, comprising using ^{a chimera} antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence

VI
represented by Sequence ID No. 43 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 44 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 45 in the Sequence Listing, an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 46 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 47 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 48 in the Sequence Listing, and an Fc region of a human type.

16. A method for separating or detecting human CD34-positive cells, comprising using a chain strand antibody, wherein the antibody comprises an H chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 43 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 44 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 45 in the Sequence Listing, and an L chain variable region of which CDR-1 is an amino acid sequence represented by Sequence ID No. 46 in the Sequence Listing, CDR-2 is an amino acid sequence represented by Sequence ID No. 47 in the Sequence Listing, and CDR-3 is an amino acid sequence represented by Sequence ID No. 48 in the Sequence Listing.

QIV 17. The method for separating or detecting cells according to any

claim 10

a ~~one of claims 10 to 16~~, wherein the antibody comprises an amino acid sequence containing a basic amino acid or acidic amino acid added to the C-terminal or N-terminal or both of the amino acid sequence of the antibody.

VII
18. An antibody comprising an H chain variable region of which CDR-1, CDR-2, and CDR-3 are amino acid sequences described in Sequence ID Nos. 1, 2, and 3, respectively, in the Sequence Listing and having affinity for CD4 antigen.

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19. An antibody comprising an L chain variable region of which CDR-1, CDR-2, and CDR-3 are amino acid sequences described in Sequence ID Nos. 4, 5, and 6, respectively, in the Sequence Listing and having affinity for CD4 antigen.

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20. A monoclonal antibody to CD4 antigen, produced by hybridoma 4H5 having a depository accession number FERM BP-6729.

VIII
a 21. A nucleic acid encoding the antibody according to ^{*claim 18*} ~~any one of~~ ~~claims 18 to 20~~.

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22. The nucleic acid according to claim 21, containing the nucleotide sequences described in Sequence ID Nos. 7 and 8.

~~III~~
23. A method for producing antibodies using the nucleic acid
a according to claim 21 ~~or 22~~.

~~III~~
24. A recombinant antibody which can be obtained by the method
according to claim 23 and which has affinity for CD4 antigen.

25. The recombinant antibody according to claim 24, wherein the
antibody has an Fc region of a human type.

26. The recombinant antibody according to claim 24, wherein the
antibody is a single chain antibody.

27. A medicinal composition comprising the antibody according to
a ~~any one of claims 18 to 20~~ ^{claim 18} and a pharmaceutically acceptable carrier.

28. A medicinal composition comprising the recombinant antibody
a according to ^{claim 24} ~~any one of claims 24 to 26~~ and a pharmaceutically
acceptable carrier.

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